

## DAFTAR PUSTAKA

- Abdelwahab, O., 2007, Kinetic and Isotherm Studies of Cooper(II) Removal from Wastewater using Various Adsorbents, *Egypt. J. Aqua. Res.*, 33(1) 125-143.
- Adawiah, S.R., 2015, Studi Adsorpsi-Desorpsi Anion Nitrat, Fosfat dan Sulfat pada Bentonit Termodifikasi CTAB, *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Aivalioti, M., Pothoulaki, D., Papoulias, P., and Gidaracos, E., 2012, Removal of BTEX, MTBE and TAME from Aqueous Solutions by Adsorption onto Raw and Thermally Treated Lignite, *J. Hazard. Mater.*, 207-208,136-146.
- Akl M.A., Youssef A.M., and Al-Awadhi M.M., 2013, Adsorption of Acid Dyes onto Bentonite and Surfactant-modified Bentonite, *Thesis*, Department of Chemistry, Faculty of Science, Mansoura University, Egypt.
- Anonim, 2014, Peraturan Pemerintah Republik Indonesia Nomor 101 tahun 2014 tentang Pengelolaan Limbah Bahan Berbahaya dan Beracun.
- Aranda, E., Marco-Urrea, E., Caminal, G., Arias, M.E., García-Romera, I., and Guillén, F., 2010, Advanced Oxidation of Benzene, Toluene, Ethylbenzene and Xylene Isomers (BTEX) by *Trametes Versicolor*, *J. Hazard. Mater.*, 181(1-3), 181-186.
- Arfan, Y., 2006, Pembuatan Karbon Aktif Berbahan Dasar Batubara dengan Perlakuan Aktivasi Terkontrol serta Uji Kinerjanya, *Skripsi*, Departemen Teknik Kimia FT UI, Jakarta.
- Argawati, B., 2014, Bentonit Termodifikasi Cetiltrimetilammonium untuk Adsorpsi Ion  $\text{Cu}^{2+}$  dan Zat Warna Anionik Eosin, *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- ATSDR (Agency for Toxic Substance and Disease Registry), 2007, Toxicological Profiles for Benzene, *US Department of Health and Human Service, Public Health Service, Atlanta*.
- Baralangi, S., 2009, Modifikasi Zeolit Alam dengan Propilamina dan N-cetil N,N,N-Trimetilammonium Bromida (CTAB) dan Aplikasinya untuk Adsorpsi Anion  $\text{MnO}_4^-$  dan  $\text{Cr}_2\text{O}_7^{2-}$ , *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Bedin, S., Oliveira, M.F., Vieira, M.G.A., Santos, O.A.A., and Silva, M.C.G., 2013, Adsorption of Toluene in Batch System in Natural Clay and Organoclay, *J. Chem. Eng.*, 32, 314-318.
- Bellir, K., Bencheikh-Lehocine, M., Meniai, A.H., and Gherbi, N., 2005, Study of The Retention of Heavy Metals by Natural Material, *Desalination*, 185, 111-119.

- Bhattacharyya, K.G., and Gupta, S.S., 2008, Kaolinite and Montmorillonite as Adsorbents for Fe(III), Co(II) and Ni(II) in Aqueous Medium, *Appl. Clay Sci.*, 41, 1-9.
- Bleday, R., Weiss, M.J., Salem, R.R., Wilson, R.E., Chen, L.B., and Steele, G. Jr., 1986, Inhibition of Rat Colon Tumor Isograft Growth with Dequalinium Chloride, *Arch. Surg.*, 121, 1272-1275.
- Bonina, F.P., Giannossi, M.L., Medici, L., Puglia, C., Summa, V., and Tateo, F., 2007, Adsorption of Salicylic Acid on Bentonite and Kaolin and Release Experiments, *Appl. Clay Sci.*, 36, 77-85.
- Bowles, J.E., 1989, *Physical and Geotechnical Properties of Oils*, Mc. Graw Hill, New York.
- Brigatti, M.F., Galan, E., and Theng, B.K.G., 2006, *Structures and Mineralogy of Clay Minerals*, Elsevier, Ltd.
- Carvalho, M.N., da Motta, M., Benachour, M., Sales, D.C.S., and Abreu, C.A.M., 2012, Evaluation of BTEX and Phenol Removal from Aqueous Solution by Multi-solute Adsorption onto Smectite Organoclay, *J. Hazard. Mater.*, 239-240, 95-101.
- Caulfield, J.A., 2008, Analytical Studies of Sorption Phenomene for Nitrogen Heterocycles, *Ph.D Thesis*, University of Denver, Colorado.
- Chen, L., Zhou, Y., Wang, X., Zwicker, T., and Lu, J., 2013, Enhanced Oil-Mineral Aggregation with Modified Bontonite, *Water Sci. Technol.*, 67, 1581-1589.
- Crawford, R.L., Alcock, J., Couvreur, J.F., Dunk, M., Fombarlet, C.O., Lethbridge, G., Mitchell, T., Molinari, M., Ruiz, H., and Walden T., 2003, *European Oil Industry Guideline for Risk-Based Assessment of Contaminated Sites (revised)*, CONCAWE Water Quality Management Groups, Brussels.
- Fauziah, H., 2011, Modifikasi Bentonit dengan Cetiltrimetilammonium Bromida untuk adsorpsi Anion Permanganat dan Kromat, *Tesis*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Fathurrahmi, 2012, Analysis of Mineral Contents Ca, Mg, Fe and Na in Natural Bentonite Clay, *J. Natur.*, 12, 32-34.
- Gao, Y., Wang, Y., and Zhang, H., 2015, Removal Rhodamine-B with Fe-Supported Bentonite as Heterogeneous Photo-Fenton Catalyst under Visible Light, *Appl. Catal. B-Environ.*, 178, 29-36.
- Garg, V.K., Kumar, R., and Gupta, R., 2004, Removal of Malachite Green Dye from Aqueous Solution by Adsorption using Agro Industry Waste: A Care Study of Prosopis Cineraria, *Dyes and Pigments*, 62, 1-10.
- Gates, W.P., Bouazza, A., and Churchman, G.J., 2009, Bentonite Clay Keeps Pollutants at Bay Elements, *Min. Soci. America*, 5(2), 105-110.

- Gede, I.A.W., 2009, Adsorpsi Ion Pb(II) oleh Lempung Terinterkalasi Surfaktan, *J. Kim*, 3(1), 27-32.
- Goodwin, J.W., 2004, *Colloids and Interfeces with Surfactant and Polymer Introduction*, John Wiley and Son, Ltd. Sussex, England.
- Gregg, S.J., and Sing, K.S.W., 1982, Adsorption, Surface Area and Porosity, Academic Press, New York, USA.
- Grim, R.E., and Guven, N., 1978, *Bentonites: Geology, Mineralogy, Properties and Uses*, Elsevier Scientific Publishing Company, New York.
- Hong, H., Jiang, W.T., Zhang, X., Tie, L., and Li, Z., 2008, Adsorption of Cr(VI) on STAC-Modified Rectorite, *Appl. Clay Sci.*, 42, 292-299.
- HSDB (Hazardous Substances Data Bank), 1999, National Library of Medicine, *Medicine Bethesda*, MD (Internet version).
- Iskandar, I., and Djajakirana, G., 2008, *Absorption Capability of HDTMA-Activated Bentonite on Organic and Inorganic Pollutant in Some Industrial Liquid Waste*, Proceeding of The International Seminar on Chemistry, 531-535.
- IPCS (International Programme on Chemical Safety), 1993, *Benzene*, World Health Organization, International Programme on Chemical Safety Environmental Health Criteria 150, Geneva.
- IARC (International Agency for Research on Cancer), 1990, Some Organic Solvents, Resin Monomers and Related Compounds, Pigments and Occupational Exposures in Paint Manufacture and Painting, Lyon, IARC, *Mono. Eval. Carcinogen. Risk Hum.*, 47, 79-123.
- Jatmika, A., 1998, Aplikasi Enzim Lipase dalam Pengolahan Minyak Sawit dan Minyak Inti Sawit untuk Produk Pangan, *Warta Pusat Penelitian Kelapa Sawit*, 6(1), 31-37.
- Jean, S., and Louis, S., 2002, *Surfactans Types and Uses, Teaching Aid in Surfactant Science and Engineering*, Facultad de Ingenieria, Universidad de Los Andes.
- Kirk, R.E., and Othmer, D.F., 1964, *Encyclopedia of Chemical Technology vol (3)*, The Interscience Encyclopedia Inc., New York, USA.
- Komadell, P., 2003, Chemically Modified Smectites, Slovak Academy of Sciences, *J. Clay Min.*, 38, 127-138.
- Koutsopoulou, E., Papoulis, D., Tsolis-Katagas, P., and Kornaros, M., 2010, Clay Minerals Used in Sanitary Landfills for The Retention of Organic and Inorganic Pollutants, *Appl. Clay Sci.*, 49, 372-382.
- Koyuncu, H., Yildiz, N., Salgin, U., Koroglu, F., and Calimli, A., 2011, Adsorption of *o*-, *m*- and *p*-Nitrophenols onto Organically Modified Bentonites, *J. Hazard. Mater.*, 185(2), 1332-1339.

- Kumar, P., and Jasra. R.V., 1995, Evolution of Porosity and Surface Acidity in Montmorillonite Clay on Acid Activation, *Ind. Eng. Chem. Res.*, 34, 1440-1448.
- Lee, J., Crum, J.R., and Boyd, S.A., 1989, Enhanced Retention of Organic Contaminants by soils exchanged with organic cations. *Environ. Sci. Technol.*, 23, 1365-1372.
- Li, Z., and Bowman, R.S., 1998, Sorption of Chromate and PCE by Surfactant Modified Clay Mineral, *Environ. Eng. Sci.*, 15(3), 237-244.
- Madejova, 1998, Comparative FT-IR Study of Structural Modifications During Acid Treatment of Dioctahedral Smectites and Hectorite, *Spectrochim. Acta.*, Part A, 1397-1406.
- Mitchell, J.K., 1993, *Fundamentals of Soil Behaviour*, 2<sup>nd</sup> Ed., Wiley and Sons Inc., New York, USA.
- Moharami, S., dan Jalali, M., 2013, Removal of Phosphorus from Aqueous Solution by Iranian Natural Adsorbents, *J. Chem. Eng.*, 223, 328-339.
- Muhammad, N., Pair, J., Smith, M.D., and Wheatley, A.D., 1998, Adsorption of Heavy Metal in Slow Sand Filters, *Proceedings of the 24<sup>th</sup> WEOC International Conference on WaterSupply and Sanitation*, Durban, South Africa.
- Nourmoradi, H., Nikaeen, M., and Khiadani, M., 2012, Removal of Benzene, Toluene, Ethylbenzene and Xylene (BTEX) from Aqueous Solutions by Montmorillonite Modified with Nonionic Surfactant: Equilibrium, Kinetic and Thermodynamic Study, *J. Chem. Eng.*, 191, 341-348.
- OEHHA (Office of Environmental Health Hazard Assessment), 1999, *Chronic Toxicity Summary Toluene*, State of California.
- Pak, A., and Mohammadj, T., 2006, Zeolite NaA Membranes Synthesis, *Desalination*, 200, 68-70.
- Perwitasari, A.A., 2007, Penentuan Luas Permukaan Zeolit menggunakan Metode Adsorpsi Isotermis Superkritis CO<sub>2</sub> dengan Model Ono-Kondo, *Skripsi*, Departemen Teknik Kimia FT UI, Jakarta.
- PPTM (Pusat Pengembangan Teknologi Mineral), 2000, *Buku Laporan Tahunan Pertambangan Tahun 1991-1995*, Departemen Pertambangan dan Energi.
- Sastrohamidjojo, H., 2007, *Spektroskopi*, 3, Liberty, Yogyakarta.
- Schoonheydt, R.A., and Johnston, C.T., in Bergaya, F., Theng, B.K.G., and Lagaly, G., 2006, *Handbook of Clay Science Developments in Clay Science*, Elsevier Ltd., 87-113.
- Sonowane, S., Chaudhari, P., Godke, S., Phadtare, S., and Meshram, S., 2008, Ultrasound Assisted Adsorption of Basic Dye Onto Originically Modified Bentonite (Nanoclay), *J. Sci. Indus. Res.*, 68, 162-167.

- Su, F., Lu, C., and Hu, S., 2010, Adsorption of Benzene, Toluene, Ethylbenzene and *p*-Xylene by NaOCl-oxidized Carbon Nanotubes, *Col. Surf. A*, 353(1),83-91.
- Supeno, M., 2007, Bentonit Alam Terpilar sebagai Material Katalis/Co-Katalis Pembuatan Hidrogen dan Oksigen dari Air, *Disertasi*, Sekolah Pasca Sarjana, Universitas Sumatera Utara, Medan.
- Suraiya, F.N., 2014, Bentonit Termodifikasi Cetiltrimetilammonium sebagai Adsorben  $Mn^{2+}$  dan  $NO_3^-$ , *Skripsi*, Departemen Kimia FMIPA UGM, Yogyakarta.
- Suryawan, B., 2004, Karakteristik Zeolit Indonesia sebagai Adsorben Uap Air, *Tesis*, Program Pasca Sarjana Bidang Ilmu Teknik FT UI, Jakarta.
- Syuhada, Wijaya, R., Jayatin, dan Rohman, S., 2009, Modifikasi Bentonit (Clay) menjadi Organoclay dengan Penambahan Surfaktan, *Jurnal Nanosains Nanoteknologi.*, 2, 1.
- Taha, K.K., Suleiman, T.M., and Musa, M.A., 2011, Performance of Sudanese Activated Bentonite in Bleaching Cottonseed Oil, *J. Bangla. Chem. Soc.*, 24(2), 191-201.
- Tan, K.H., 1982, *Principles of Soil Chemistry*, Marcel Dekter, New York.
- Tomic, Z.P., Mladenovic, S.B.A., Babic, B.M., Logar, V.A.P., Dordevic, A.R., and Cuvac, S.B., 2011, Modification of Smectite Structure by Sulfuric Acid and Characteristics of the Modified Smectite, *J. Agric. Sci.*, 56, 1.
- TPRI (Total Petrochemicals and Refining USA, Inc.), 2012, *Benzene Safety Data Sheet*, Total Petrochemicals and Refining, Inc., Houston.
- US EPA (US Environmental Protection Agency), 1988, US EPA Office of Drinking Water Health Advisories, *Environ. Contam. Toxic. Reviews.*, 106, 189-203.
- Vidal, N., and Volzone, C., 2012, Influence of Organobentonite Structure on Toluene Adsorption from Water Solution, *Mater. Res.*, 15(6), 944-953.
- Weiss, M.J., Wong, J.R., Ha, C.S., Bleday, R., Salem, R.R., Steele, G.D. Jr., and Chen, L.B., 1987, Dequalinium, a Topical Antimicrobial Agent, Displays Anticarcinoma Activity Based on Selective Mitochondrial Accumulation, *Proc. Natl. Acad. Sci. U.S.A.*, 84, 5444-5448.
- WHO, 2004, *Toluene in Drinking-Water, Background Document for Development of WHO Guidelines for Drinking-water Quality*, World Health Organization, Geneva, Switzerland.
- WHO, 2010, *Preventing Disease through Healthy Environments Exposure to Benzene a Major Public Health Concern*, World Health Organization Document Production Services, Geneva, Switzerland.
- Xi, Y., 2006, Synthesis, Characterization and Application of Organoclays, *Ph.D. Thesis*, Tianjin University, China.



UNIVERSITAS  
GADJAH MADA

**KAJIAN ADSORPSI BENZENA DAN TOLUENA PADA BENTONIT TERMODIFIKASI  
CETILTRIMETILAMMONIUM BROMIDA**

LAXMIDA FARADIBA H, Dr. Sutarno, M.Si.; Dr. Indriana Kartini, M.Si.

Universitas Gadjah Mada, 2016 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Yip, K.W., Mao, X., Au, P.Y., Hedley, D.W., Chow, S., Dalili, S., Mocanu, J.D., Bastianutto, C., Schimmer, A., and Liu, F.F., 2006, Benzethonium Chloride: a Novel Anticancer Agent Identified by Using a Cell-Based Small-Molecule Screen, *Clin. Cancer Res.*, 12, 5557-5569.